Gonorrhea

Infections due to *Neisseria gonorrhoeae*, like those due to *Chlamydia trachomatis*, remain a major cause of pelvic inflammatory disease, tubal infertility, ectopic pregnancy, and chronic pelvic pain in the United States. Epidemiologic studies provide strong evidence that gonococcal infections facilitate HIV transmission, and biological studies have begun to clarify the specific mechanisms through which this facilitation occurs[1]. Reporting of gonococcal infections has likely been biased towards reporting of infections in persons of minority race or ethnicity who attend public STD clinics[2].

In 1998, case reporting data indicated a reversal in the annual decreases that had been observed in preceding years.

- In 1998, 355,642 cases of gonorrhea were reported in the United States. Following the introduction of a national control program in the mid-1970s, the overall rate of gonorrhea has declined 72% since 1975. However, between 1997 and 1998 the rate increased by 8.9% from 122.0 cases per 100,000 persons to 132.9 (Table 1 and Figure 11).
- In 1998, 28 states and 3 outlying areas reported gonorrhea rates below the Healthy People 2000 (HP2000) national objective of 100 cases per 100,000 persons (Figure 12 and Table 13). However, gonorrhea rates decreased between 1997 and 1998 in only 7 of 35 states reporting more than 1,000 cases in 1998, whereas rates in the previous year decreased in 23 of 34 states with more than 1,000 cases (Table 14).
- Three of the four regions (West, Midwest, and South) exhibited increases in their gonorrhea rates between 1997 and 1998. All four of the regions had been declining. The South continued to have a higher rate than other regions (Figure 13, Table 14).
- In contrast to preceding years when consistent decreases occurred, the overall gonorrhea rate (244.4 per 100,000) for selected large cities over 200,000 population increased in 1998 for the second year in a row (Figure 14, Table 18). Fifty-five (86%) of the 64 cities had rates exceeding the HP2000 objective (Table 17).
- The gonorrhea rate in women increased from 119.0 per 100,000 in 1997 to 131.5 in 1998, and the gonorrhea rate in men also increased from 124.9 in 1997 to 133.7 in 1998. Rates for men and women were above the HP2000 objective in 22 and 24 states, respectively (Figure 15, Tables 15 and 16).
- Relative to 1997, gonorrhea rates in 1998 increased among each race/ethnic group (non-Hispanic whites increased 8%; non-Hispanic blacks 7%; Hispanics 10%; Asian Pacific Islanders 12%; and American Indian/Alaska Natives 21% (Figure 16 and Table 12B). The gonorrhea rates for non-Hispanic blacks and American Indian/Alaska Natives were above the HP2000 objective (Figure 16,

Table 12B). The former rate was about 30 times greater than the rate for non-Hispanic whites.

- Between 1997 and 1998, the gonorrhea rates for 15- to 19-year-old adolescents increased from 521.6 per 100,000 to 560.6, and for 20- to 24-year-old young adults increased from 548.4 to 609.6. Except for adults 65 and older, the rates for the other age groups also increased between 1997 and 1998 (Table 12B).
- Among women, 15- to 19-year-olds had the highest rate, while among men, 20- to 24-year-olds had the highest rate (Table 12B and Figure 17).
- In 1998, state-specific gonorrhea test positivity among 15 to 24-year old women screened in selected family planning clinics in 27 states ranged from 0.0% to 5.2% (Figure 18).
- Antimicrobial resistance remains an important consideration in the treatment of gonorrhea[3,4]. Overall, 29.4% of isolates collected in 1998 by the Gonococcal Isolate Surveillance Project (GISP) were resistant to penicillin, tetracycline, or both. The percentage of GISP isolates that were penicillinase-producing *Neisseria gonorrhoeae* (PPNG) declined from a peak of 11.0% in 1991 to 3.0% in 1998 (Figure 20). In contrast, the percentage of isolates with chromosomally mediated resistance to penicillin has increased annually and went from 0.5% in 1988 to 5.1% in 1998 (Figure 21). The prevalence of chromosomally mediated tetracycline resistance, 6.8% in 1998, has been relatively stable since 1989, except for a transient increase in 1995. However, the prevalence of isolates with chromosomally mediated resistance to penicillin and tetracycline (CMRNG) increased from 3.0% in 1989 to 7.2% in 1998 (Figure 21).
- The proportion of GISP isolates demonstrating decreased susceptibility to ciprofloxacin, one of the currently recommended treatments for gonorrhea, decreased from a high of 1.3% in 1994 to 0.5% in 1996 and 1997, but increased to 0.9% in 1998. Resistance to ciprofloxacin was first identified in GISP in 1991 but remains rare (0.1%) in 1998 (Figure 22). Reduced susceptibility and resistance to ciprofloxacin correlate with reduced susceptibility and resistance to other fluoroquinolone antibiotics.
- The proportion of GISP isolates demonstrating decreased susceptibility to cefixime remains rare (0.1%). In 1998, all GISP isolates were susceptible to ceftriaxone. To date, no cephalosporin resistance has been identified in GISP.
- The percentage of men with gonorrhea who have repeat infection within a one-year period, as measured by the GISP, decreased from 21.5% in 1992 to 17.5% in 1998 (Figure 23), approaching the HP2000 objective of 15%.
- GISP also reports the percentage of *Neisseria gonorrhoeae* isolates obtained from men who have sex with men (MSM)[4,5]. The proportion of isolates coming from MSM increased from 4.0% in 1988 to 12.0% in 1998 for GISP clinics overall. Among the nine GISP clinics reporting the majority of MSM cases, the percentage of cases that were in MSM in 1998 ranged from 13.0% to 62.5%, with a median of 24.7% (Figure 24). The increase in MSM with gonorrhea in GISP accelerated after 1993.
- Additional information about gonorrhea in racial and ethnic minority populations and adolescents can be found in the **Special Focus Profiles** section.

[1]Cohen MS, Hoffman IF, Royce RA, et al. Reduction of concentration of HIV-1 in semen after treatment of urethritis: implications for prevention of sexual transmission of HIV-1. *Lancet* 1997;349:1868-73.

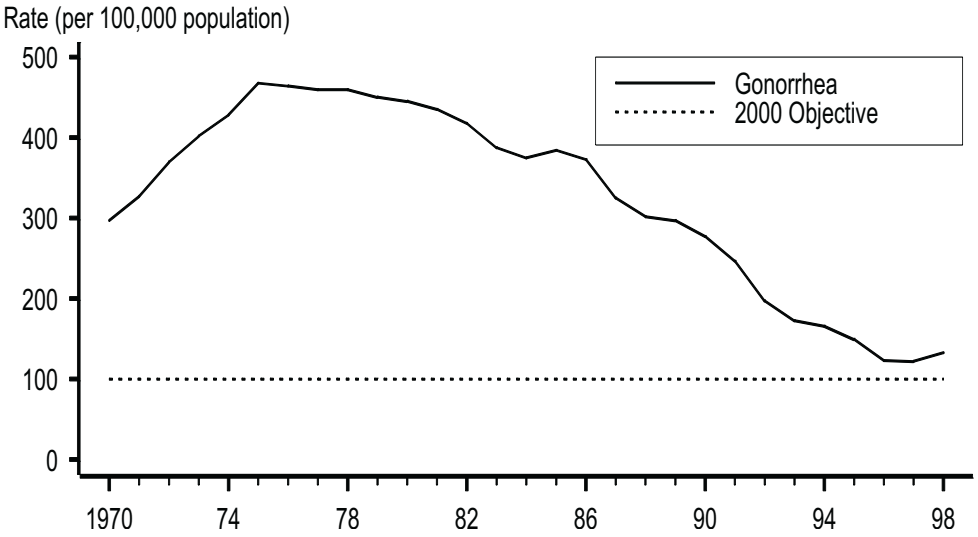
[2]Fox KK, Whittington W, Levine WC, Moran JS, Zaidi AA, Nakashima AN. Gonorrhea in the United States, 1981-1996: demographic and geographic trends, *Sex Transm Dis* 1998;25(7):386-93.

[3]Fox KK, Knapp JS, Holmes KK, Hook III EW, Judson FN, Thompson SE, Washington JA, Whitting WL. Antimicrobial resistance in *Neisseria gonorrhoeae* in the United States, 1988-1994: the emergence of decreased susceptibility to the fluoroquinolones, *J Infect Dis 1997*;175:1396-1403.

[4]CDC. Sexually transmitted disease surveillance 1997. Supplement: Gonococcal isolate surveillance project (GISP) annual report 1997, U.S. Department of Health and Human Services. Atlanta: Centers for Disease Control and Prevention, October 1998.

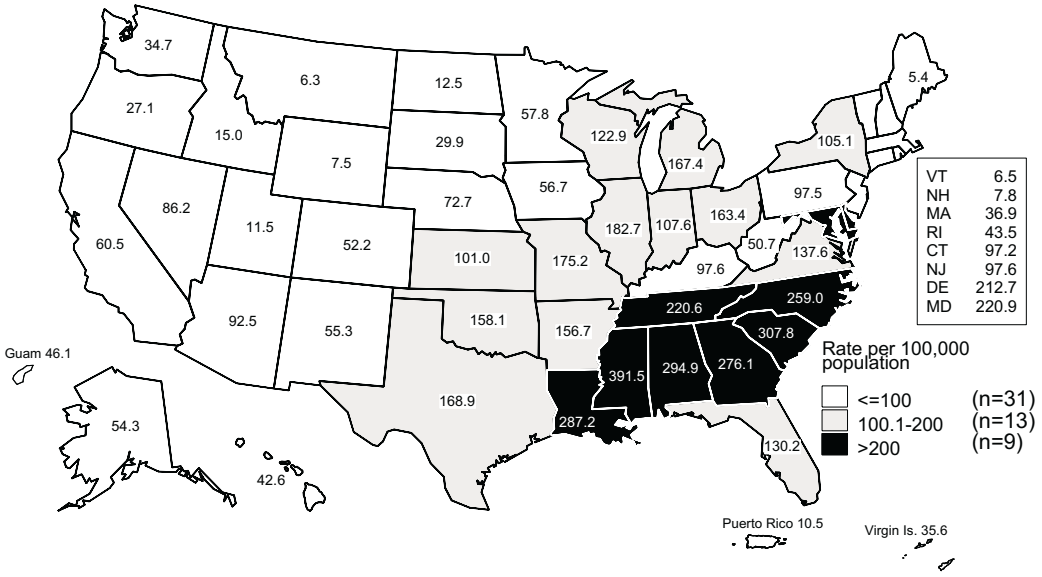
[5]CDC. Gonorrhea among men who have sex with men - selected sexually transmitted disease clinics, 1993-1996. *MMWR* 1997;46:889-92.

Figure 11. Gonorrhea — Reported rates: United States, 1970–1998 and the Healthy People year 2000 objective



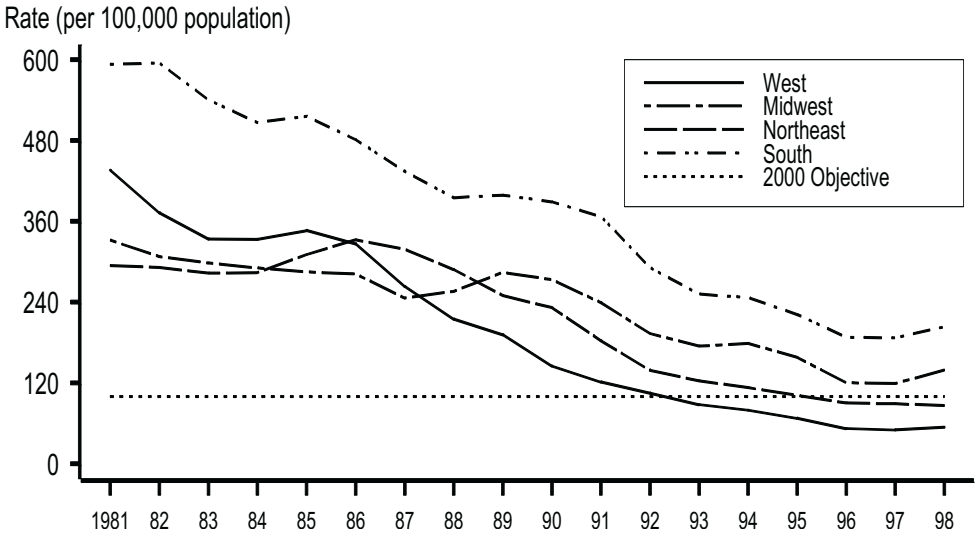
Note: Georgia did not report gonorrhea statistics in 1994 (see Appendix).

Figure 12. Gonorrhea — Rates by state: United States and outlying areas, 1998



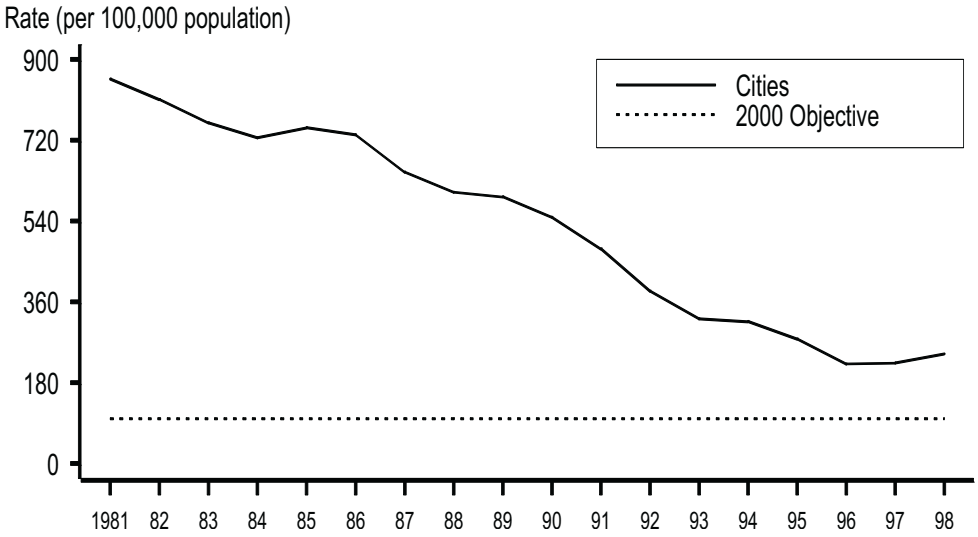
Note: The total rate of gonorrhea for the United States and outlying areas (including Guam, Puerto Rico and Virgin Islands) was 131.1 per 100,000 population. The Healthy People year 2000 objective is 100 per 100,000 population.

Figure 13. Gonorrhea — Rates by region: United States, 1981–1998 and the Healthy People year 2000 objective



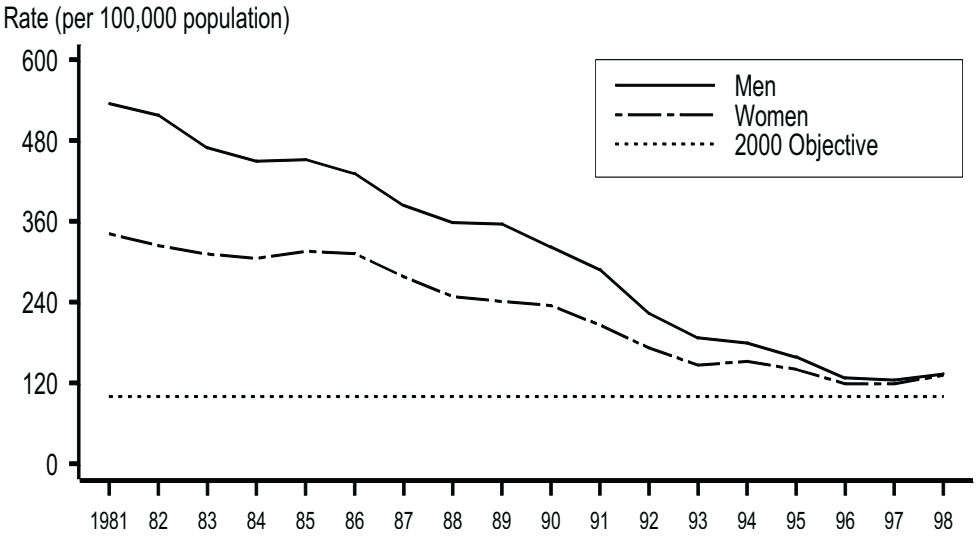
Note: Georgia did not report gonorrhea statistics in 1994 (see Appendix).

Figure 14. Gonorrhea — Rates in selected U.S. cities of >200,000 population, 1981–1998 and the Healthy People year 2000 objective



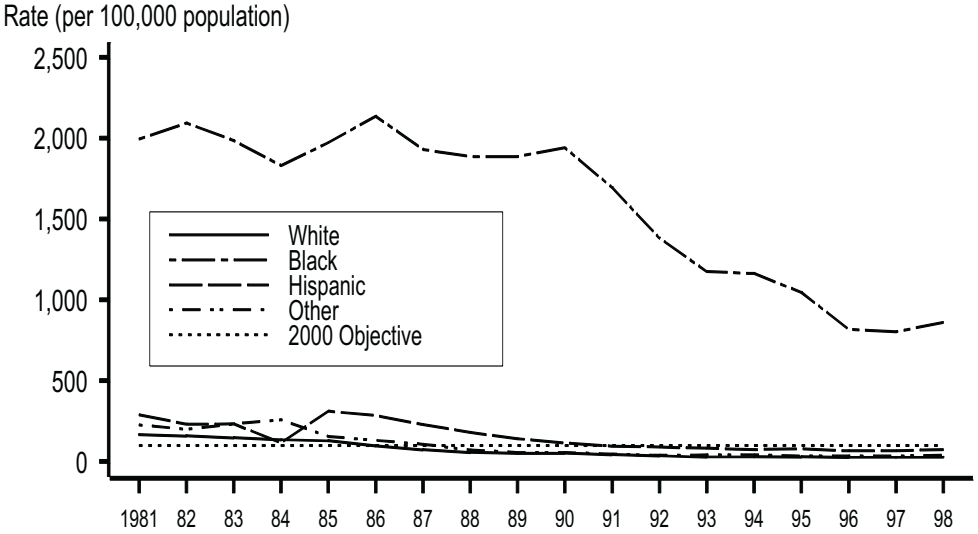
Note: Atlanta, GA did not report gonorrhea statistics in 1994 (see Appendix).

Figure 15. Gonorrhea — Rates by gender: United States, 1981–1998 and the Healthy People year 2000 objective



Note: Georgia did not report gonorrhea statistics in 1994 (see Appendix).

Figure 16. Gonorrhea — Rates by race and ethnicity: United States, 1981–1998 and the Healthy People year 2000 objective



Note: "Other" includes Asian/Pacific Islander and American Indian/Alaska Native populations. Black, White, and Other are non-Hispanic. Georgia did not report gonorrhea statistics in 1994 (see Appendix).

Figure 17. Gonorrhea — Age- and gender-specific rates: United States, 1998

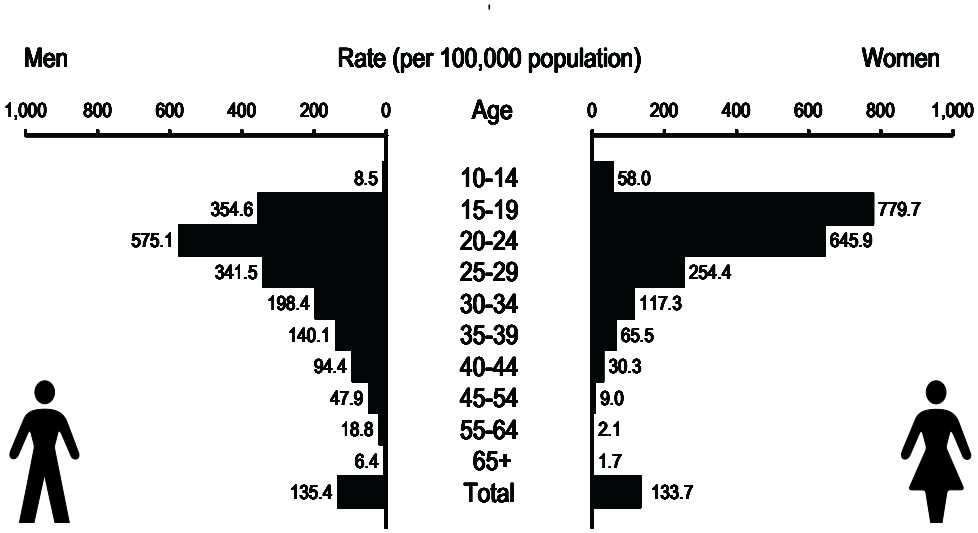
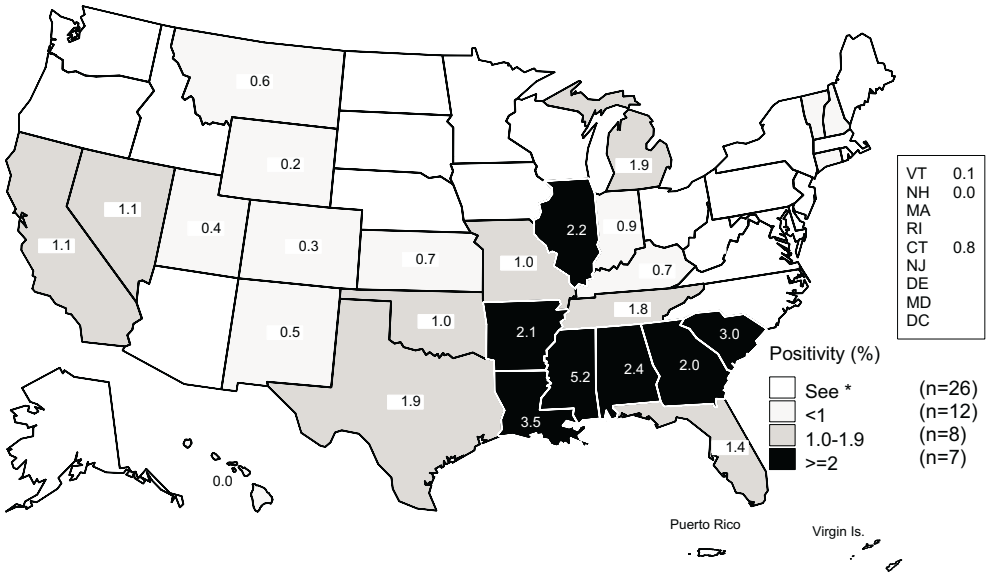


Figure 18. Gonorrhea — Positivity among 15-24 year old women tested in family planning clinics by state, 1998



*States reported gonorrhea positivity data on less than 500 women aged 15-24 years during 1998.

SOURCE: Regional Infertility Prevention Programs; Office of Population Affairs; Local and State STD Control Programs; Centers for Disease Control and Prevention

Figure 19. Gonococcal Isolate Surveillance Project (GISP) — Location of participating clinics and regional laboratories: United States, 1998

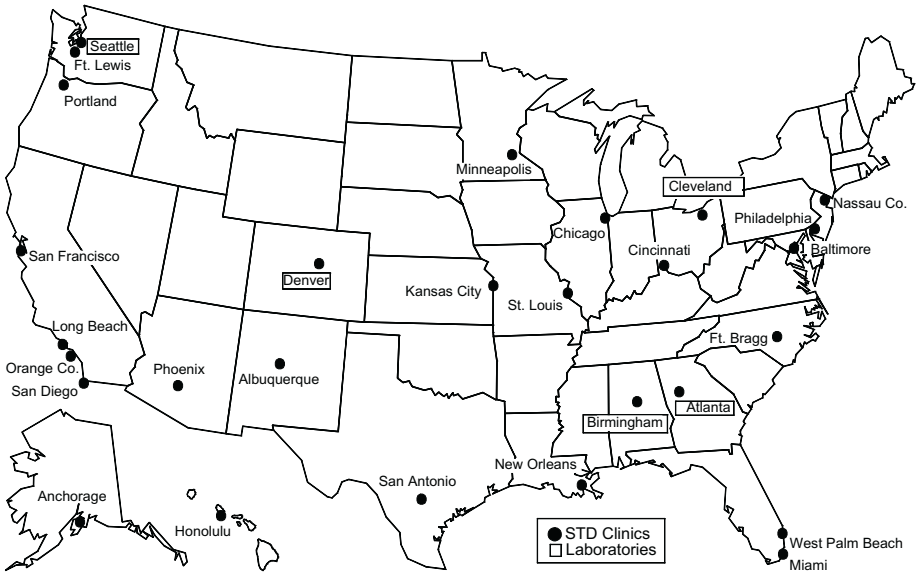
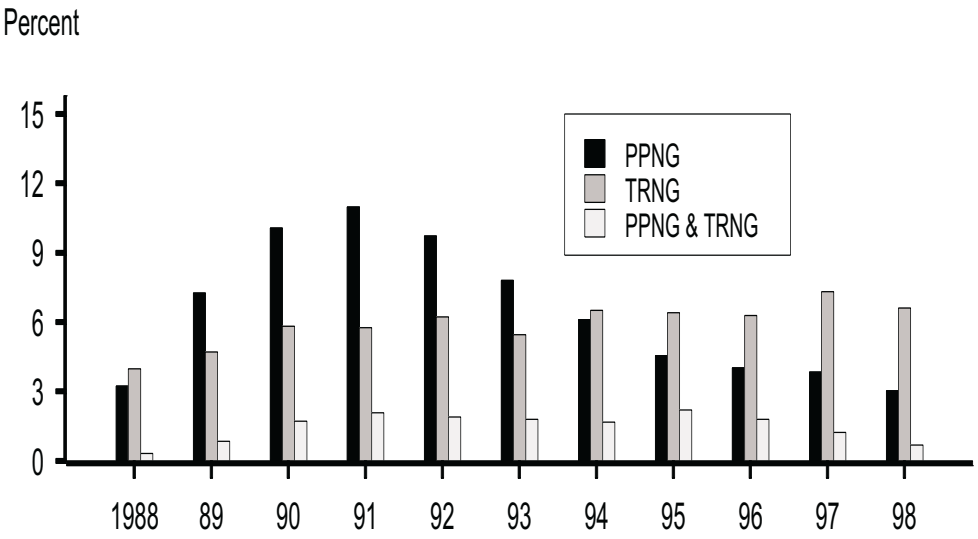
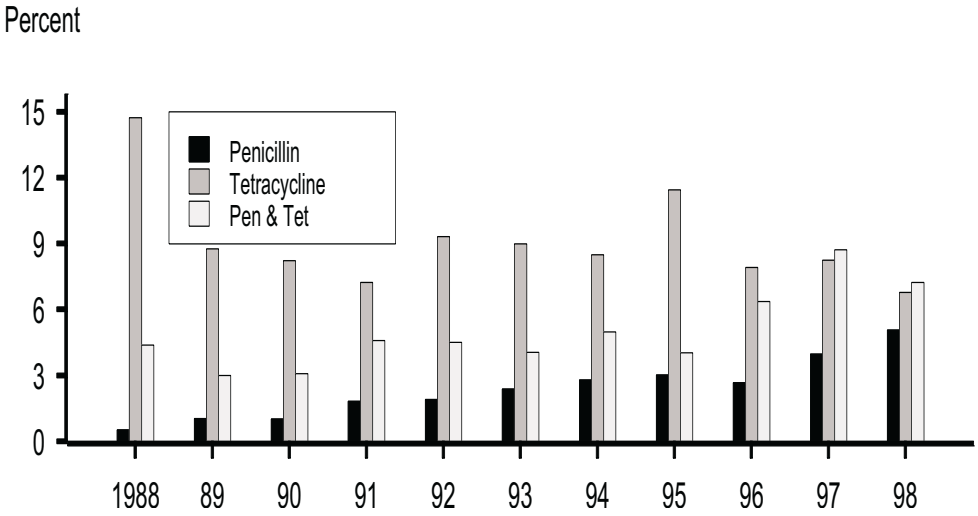


Figure 20. Gonococcal Isolate Surveillance Project (GISP) — Trends in plasmid-mediated resistance to penicillin and tetracycline, 1988–1998



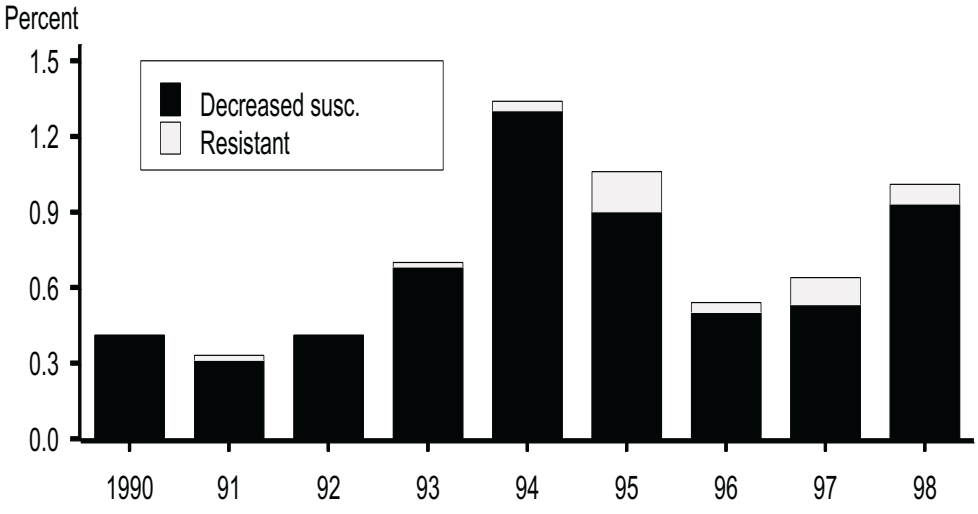
Note: "PPNG" (penicillinase-producing *Neisseria gonorrhoeae*) and "TRNG" (tetracycline-resistant *N. gonorrhoeae*) refer to plasmid-mediated resistance to penicillin and tetracycline, respectively.

Figure 21. Gonococcal Isolate Surveillance Project (GISP) — Trends in chromosomally mediated resistance to penicillin and tetracycline, 1988–1998



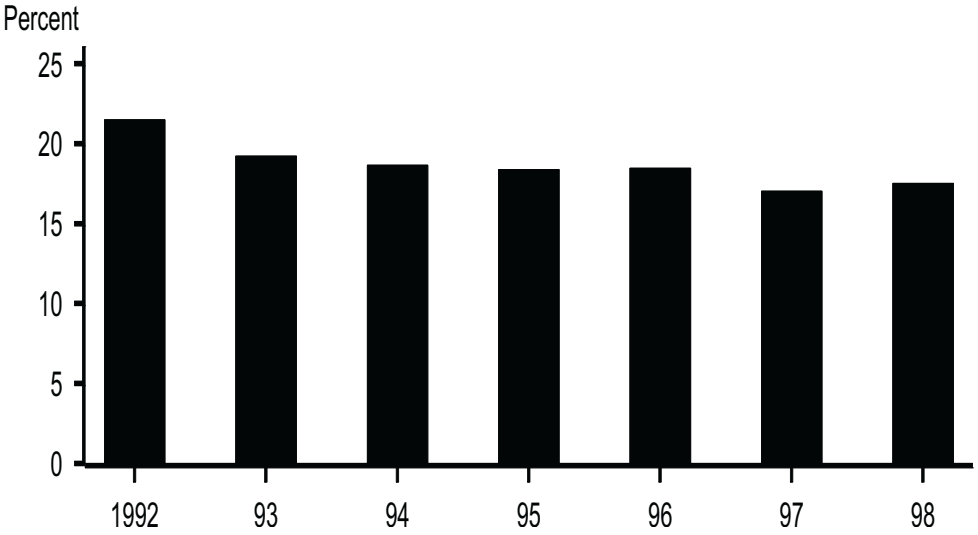
Note: Chromosomally mediated resistance to penicillin denotes a minimum inhibitory concentration (MIC) of greater than or equal to 2 μg penicillin/mL and beta-lactamase negative; chromosomally mediated resistance to tetracycline corresponds to a MIC of greater than or equal to 2 μg tetracycline/mL without plasmid-mediated tetracycline resistance.

Figure 22. Gonococcal Isolate Surveillance Project (GISP) — Prevalence of *Neisseria gonorrhoeae* with decreased susceptibility or resistance to ciprofloxacin, 1990–1998



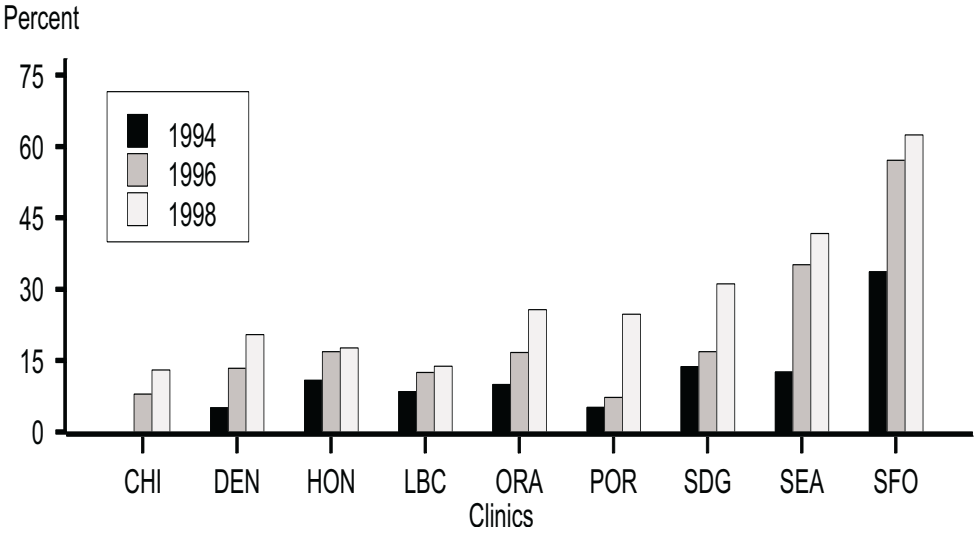
Note: Resistant isolates have MICs greater than or equal to 1 μg ciprofloxacin/mL. Isolates with decreased susceptibility have MICs of 0.125 - 0.5 μg ciprofloxacin/mL. There were twenty three (23) resistant isolates: one in 1991, one in 1993, two in 1994, eight in 1995, two in 1996, five in 1997 and four in 1998. Susceptibility to ciprofloxacin was first measured in GISP in 1990.

Figure 23. Gonococcal Isolate Surveillance Project (GISP) — Proportion of men with gonorrhea who had a previous gonorrhea infection within the past year, 1992–1998



Note: GISP cases with no information on previous episodes of gonorrhea were excluded. Data on previous episodes of gonorrhea were first collected in 1992.

Figure 24. Gonococcal Isolate Surveillance Project (GISP) — Percent of *Neisseria gonorrhoeae* isolates obtained from men who have sex with men for STD clinics in nine cities, 1994, 1996 and 1998



Note: In 1998, these nine clinics reported 87.3% (439/503) of GISP gonorrhea cases in men who have sex with men. Chicago first participated in 1996. Clinics include: CHI=Chicago, IL; DEN=Denver, CO; HON=Honolulu, HI; LBC=Long Beach, CA; ORA=Orange County, CA; POR=Portland, OR; SDG=San Diego, CA; SEA=Seattle, WA; and SFO=San Francisco, CA.